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ABSTRACT

In May, 1972, the Kingsport (Tennessee) City School System received financial assistance from the Tennessee Valley Authority to plan, develop, and implement, as a demonstration environmental education project, the utilization of a mobile laboratory for conducting environmental studies. The project, as described in this booklet, identified four areas which could be improved through a mobile unit approach: (1) serve as a basic resource for conducting teacher workshops and inservice training programs on-site at each school or at selected community resource facilities, (2) develop instructional materials designed for use with the mobile unit and focusing on community resources, (3) provide resources, including equipment, which were previously unavailable, for conducting environmental studies, and (4) allow for more activities, previously requiring transportation, to be conducted on-site at the school or community resource facilities within walking distance. Project objectives, philosophy and approach of the program, curriculum development activities, and inservice training are described. Detailed also is the physical design of the mobile environmental education laboratory, with side, top, and rear views of the mobile van and its compartments. A list of materials and equipment included in the unit is specified together with a cost analysis of the project. (BL)

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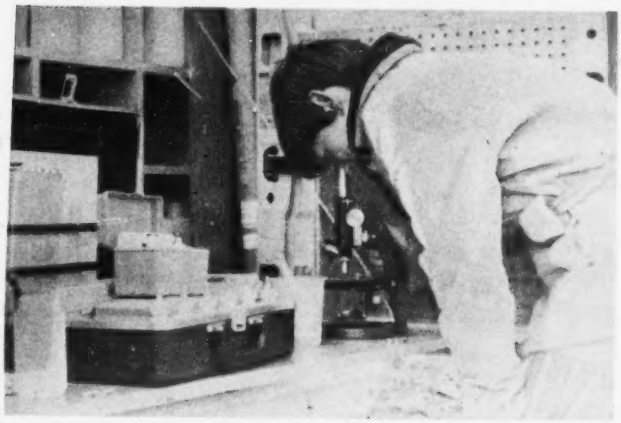

Mobile Environmental Education Laboratory

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KINGSPORT CITY SCHOOLS

KINGSPORT, TENNESSEE

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MOBILE ENVIRONMENTAL EDUCATION LABORATORY

KINGSPORT CITY SCHOOLS
Kingsport, Tennessee 37664
(May, 1972 - June, 1973)

Superintendent of Schools
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Project Director
Ronald B. Childress

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Ronald B. Childress
Ronald B. Childress
Project Director

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INTRODUCTION

In May, 1972, the Kingsport City School System received financial assistance from the Tennessee Valley Authority to plan, develop, and implement, as a demonstration environmental education project, the utilization of a mobile laboratory for conducting environmental studies.

Project Basis

When initially investigating the possibility of developing and utilizing a mobile unit, the Kingsport City School System identified four needs which would be fulfilled through the use of the mobile unit approach. These needs and the role of the mobile unit are:

a. Traditionally, teacher training institutions have failed to prepare elementary and secondary teachers in the methods and techniques necessary to conduct environmental investigations. The mobile environmental education laboratory serves as a basic resource for conducting teacher workshops and in-service training sessions in environmental study areas at each school as well as on-site at selected community resource facilities.

b. A shortage of instructional materials designed for use with community resources curtailed the use of many valuable resource facilities. Instructional materials designed for use with the mobile unit and focused on community resources were developed as a major component of the total project.

c. A lack of the necessary equipment and materials for conducting environmental investigations placed limitations on the types of activities that could be carried on. The mobile unit and included equipment provides resources, previously unavailable, for conducting environmental studies.

d. The inconvenience, loss of time, and expense involved in providing transportation to community resource facilities distant from the school constituted a major logistical problem for teachers. Through use of the mobile unit, included equipment, and community focused instructional activities, many activities previously requiring transportation can now be conducted on-site at the school or at community resource facilities within walking distance.

Project Objectives

The primary objective of this project is to demonstrate and verify a new concept in environmental education for the Kingsport City School System by:

a. providing in-service training to elementary (including preschool), secondary, and postsecondary education personnel to enable them to participate effectively in environmental education programs;

b. developing materials designed to assist the introduction of environmental studies in existing programs and/or strengthen the content of existing environmental programs at all educational levels;

c. developing curricula which will provide useful learning experiences leading to an understanding of environmental principles, problems and their causes, and possible solutions to those problems.

PROGRAM DESCRIPTION

Philosophy and Approach

Centered around environmental problems and the wise use of resources, Kingsport's environmental education program is interdisciplinary, activity focused, involvement oriented, and directed toward making education more relevant to the real life experiences of students.

The total program is founded on the realization that there is a definite need for learning experiences which help students become:

a. Aware of the natural and man-made environment and the related problems.

b. Knowledgeable and accurately informed about the total environment and the related problems.

c. Motivated to find alternatives or solutions to these problems.

d. Committed to and involved in some type of constructive action to remedy these problems.

With this philosophy as the foundation, the mobile unit, included equipment, and instructional materials become an integral part of the total environmental education program of the Kingsport City School System. Other phases of the program include day-use of community resource facilities, participation in a residence environmental education program and the development and utilization of environmental study areas on school sites. Examples of community resources utilized range from sewage treatment plants and vacant lots in the urban environment to natural or wilderness areas in the rural environment. Third, fourth, fifth, and sixth grade students participate in the Maryville College Environmental Education Program, a week-long residence experience jointly sponsored by the National Park Service and Maryville College. Following comprehensive plans prepared in cooperation with the Soil Conservation

Service and the Tennessee Valley Authority, Kingsport teachers and students are developing and using their school campuses for conducting environmental studies. All phases of the program are preceded and followed with related classroom instructional activities and projects.

Curriculum Development

Curriculum materials for utilizing the mobile unit were developed in a summer Curriculum Development Workshop held June-August, 1972. Participants in the workshop included one senior high, two junior high, and two elementary school classroom teachers. The systemwide Environmental Education Coordinator is serving as director for the entire project. Consultant expertise was utilized throughout the workshop.

These curricular materials are directed to all grade levels and integrate all curriculum areas. With the mobile unit serving as the primary resource, investigations were developed which include man's relationship with the natural and man-made surroundings, including the relation of population pressures, pollution, resource allocation and depletion, conservation, technology, and urban and rural planning to the total human environment. Economic, social and political aspects of environmental relationships were considered throughout development.

Evolving from this workshop was a series of 44 student and three teacher in-service environmental education instructional activities. These activities have been combined into a publication entitled Investigations For A Mobile Environmental Education Laboratory.

In-Service Training

As a part of curriculum development, materials were designed and developed for use in in-service training. These materials are designed for all grade levels and relate to all curriculum areas. The mobile unit and included equipment serve as a basic resource for conducting teacher workshops and in-service training programs on-site at each school or at selected community resource facilities. Before scheduling the use of the unit with a class, the teacher is involved in an in-service program relating to the mobile unit, included equipment, and instructional activities.

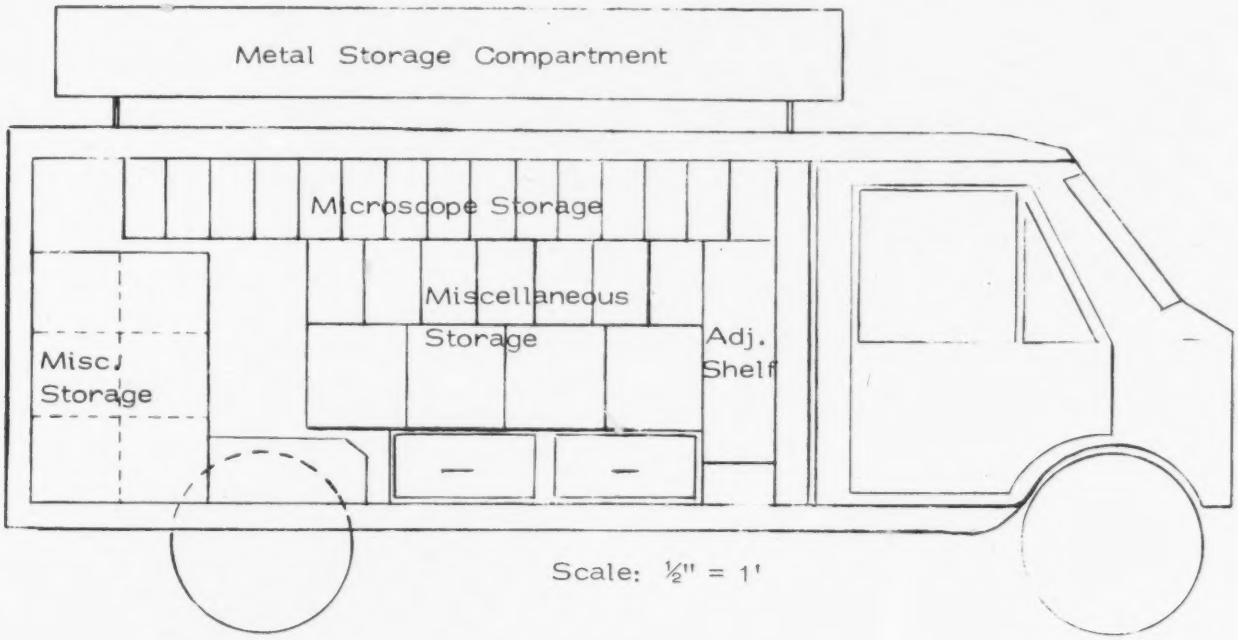
MOBILE ENVIRONMENTAL EDUCATION LABORATORY DESIGN

Introduction

The foundation of the entire project is a one-half ton, 1972, Ford Econoline van which has been designed and equipped with storage facilities for housing environmental study equipment. (See illustrations on the following pages.) The top side of the unit has been equipped with a large metal storage compartment covered with thick canvas which serves as a protective device for stored equipment, while at the same time, providing a pull down canopy which protects students and equipment during periods of inclement weather. (See center photograph on front cover.) Special safety features include extra suspension and the addition of a protective metal screen between the driver and the storage area.

MOBILE ENVIRONMENTAL EDUCATION LABORATORY

ROADSIDE VIEW



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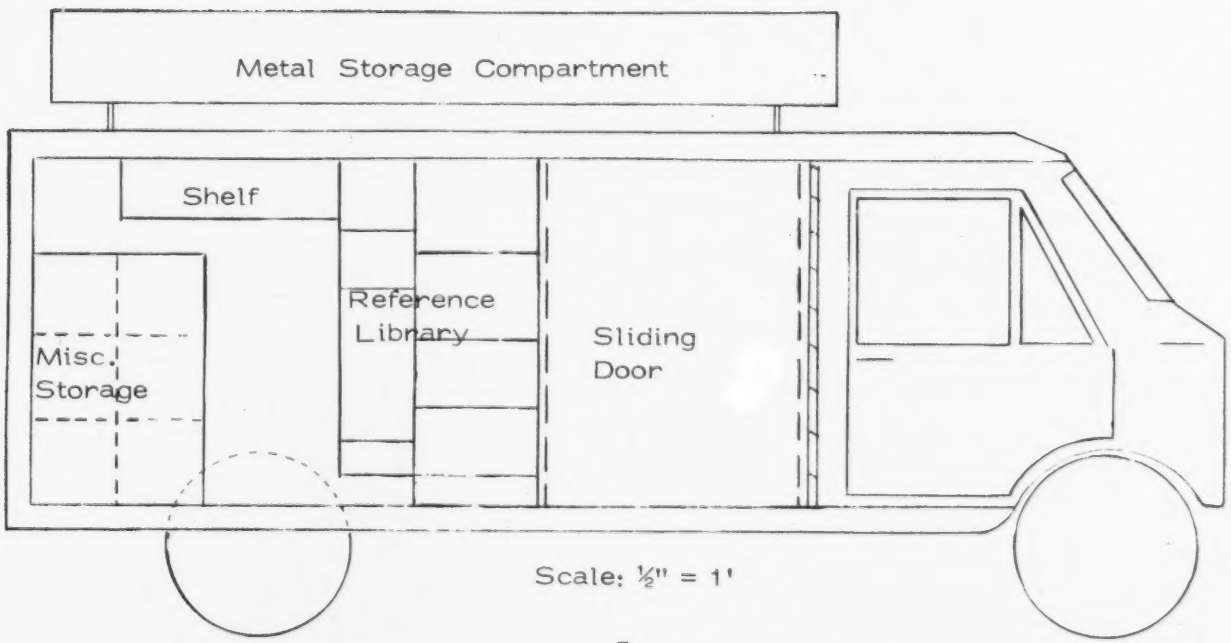
CURBSIDE VIEW



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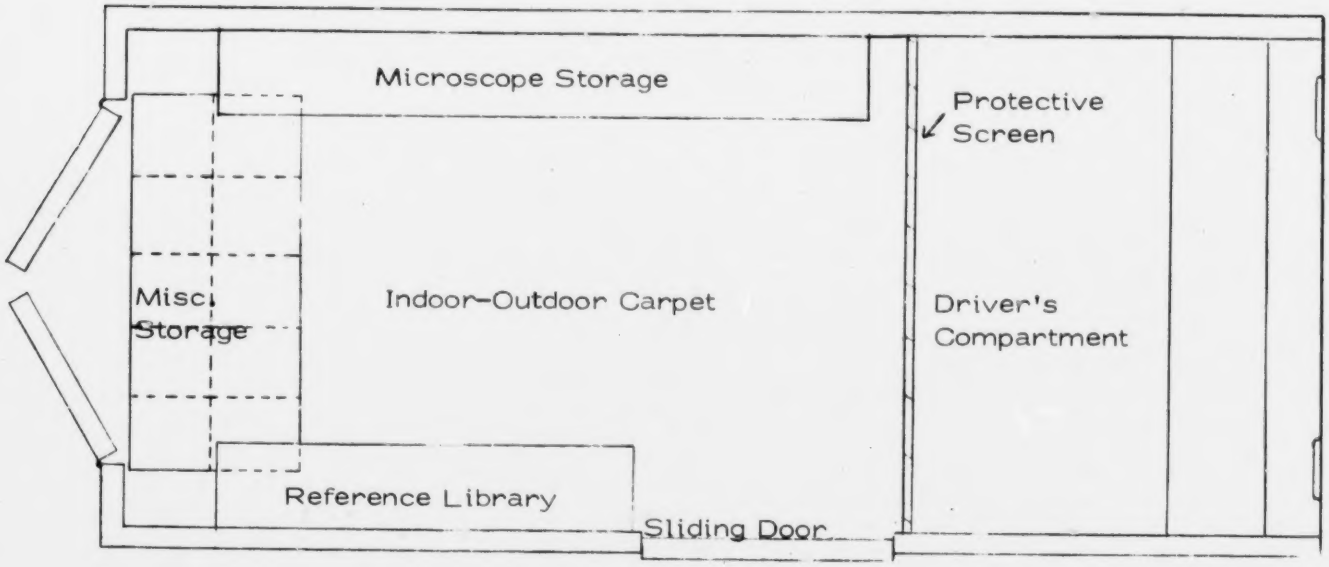
MOBILE ENVIRONMENTAL EDUCATION LABORATORY

TOP VIEW



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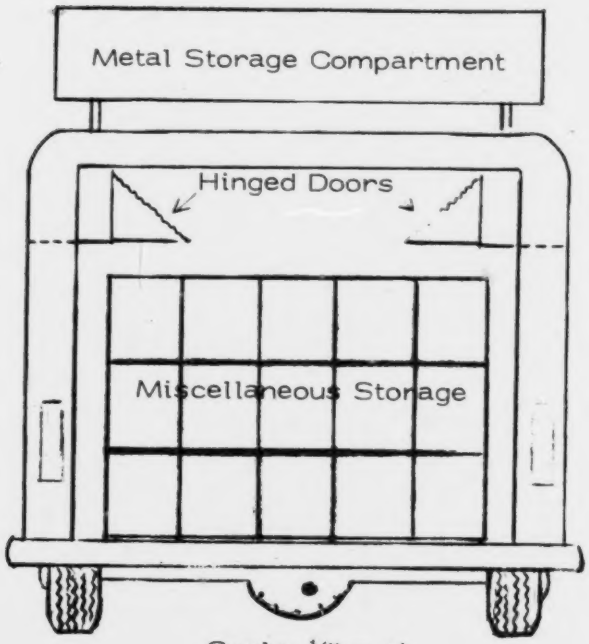
REAR VIEW



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MATERIALS AND EQUIPMENT

Introduction

Equipment and materials included with the mobile unit are divided into five categories:

a. Laboratory Apparatus
b. Tools and Related Equipment
c. Reagents
d. Miscellaneous and Special Equipment
e. Environmentally and Ecologically Related Equipment

A part of the mobile unit equipment includes a reference library stocked with materials and publications relevant to conducting environmental studies. Included are selections from the Peterson Field Guide Series, the Golden Nature Series, and related ecological publications. Additional materials include books, pamphlets and reference materials dealing with environmental problems and various environmental education programs.

Materials and Equipment List

a. Tools and Related Equipment

Tape--Rule (10' and 100')
Mattocks
Budding and Grafting Knife
Pruning Shears
Field Trowels
Collecting Spades
Collecting Tools

b. Miscellaneous and Special Equipment

Tape Recorder
Camera
Film
Folding Tables, Aluminum
Metal Easel
Chalk, Assorted Colors
Clip Boards
Slide Projector

c. Laboratory Apparatus

Microscopes
Microscope Slides
Slide Cover Slips, Acetate and Glass
Stop Watch
Cotton Twine
Rope
Funnels, Polyethylene
Pipettes, Polyethylene
Test Tubes
Medicine Droppers
Test Tube Rack
Plastic Trays

Laboratory Apparatus (continued)

Laboratory Aprons
Finger Bowls
Plastic Dishes
Dispensing Carbow
Beakers, Polyethylene
Meter Sticks
Triple-Beam Balance
Ph Paper
Stoppers, Assorted Rubber
Storage Bottles, Polyethylene
Fire Extinguisher

d. Environmentally and Ecologically Related Equipment

Insect Pins
Insect Killing Bottle
Air Pollution Tester
Canvas Side Sacks
Stream Thermometers
Dissecting Pins
Polyethylene Pails
Soil Thermometers
Limnological Testing Equipment (Natural Systems)
Pocket Field Magnifiers
Soil Testing Equipment
Animal Traps (Various Sizes)
Insect Nets
Insect Spreading Boards
Water Pollution Detection Kit
Water Sampling Bottle
Sounding Lead and Calibrated Line
Bottom Sampling Dredge
Secchi Disk
Plankton Net
Forel-Ule Color Scale
Water Testing Thermometers
Binoculars
Berlese Apparatus
Magnetic Compass
Collecting Jars, Polyethylene
Animal Cages (Various Sizes)
Dissecting Sets
Geology Picks
Soil Auger
Plant Press
Ecology Collecting Sack
Vasculum
Ringleman Charts
Increment Borer
Biltmore Cruiser Sticks
Tree and Log Scales
Noise Detection Equipment

e. Reagents

Ethyl-Alcohol
Formaldehyde
Chloroform

PROJECT COST ANALYSIS

Introduction

The primary source of funding for the planning, development and implementation of the mobile environmental education laboratory was the Tennessee Valley Authority. Since it was a cooperative demonstration project, additional contributions were made by the Kingsport City School System. On the following page is an analysis of total project costs. No effort is made to itemize contributions by the cooperating school system, however, these contributions included the salary of the Project Director, office space, clerical help, and miscellaneous operating costs for the project.

Cost Analysis

Total Project Costs can be categorized as follows:

A. T.V.A. Funding			
1. Materials and Equipment			
Purchase of 1972 Ford Econoline Van	$2,700.00		
Design and Construction of Van Storage Facilities	2,500.00		
Environmental Study Materials and Equipment for Stocking Van	5,000.00		
Total Materials and Equipment		$10,200.00	
2. Administrative and Clerical Costs			
Curriculum Materials Development Workshop	$2,100.00		
Total Administrative and Clerical		$ 2,100.00	
3. Instructional and Program Costs			
Workshop Participants	$4,700.00		
Consultants	1,500.00		
Total Instructional and Program		$ 6,200.00	
4. Supplies, Reproduction and Communication	$1,000.00		
Total Supplies, Reproduction and Communication		$ 1,000.00	
TOTAL T.V.A. FUNDING			$19,500.00
B. TOTAL KINGSPORT CITY SCHOOLS CONTRIBUTIONS			$10,000.00
C. TOTAL PROJECT COSTS			$29,500.00

SUMMARY

The utilization of the mobile environmental education laboratory for environmental studies is a unique and worthwhile approach for a school system. Considering the many educational benefits, the cost of such a project is very practical. This approach has broad implications for environmental education on a county, regional, or state level. Anyone interested in asking specific questions about this project or in receiving additional information should contact:

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